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EXAMINER

CADUGAN, ERICA E

ART UNIT PAPER NUMBER

3722

DATE MAILED: 01/21/2004

18

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/007,274

Applicant(s)

KATO, HEIZABURO

Examiner

Erica E Cadugan

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-- Th MAILING DATE of this communication app ars on the cov r she t with th corr spondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 17.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 19 is objected to because of the following informalities: it appears that “to process an object” should actually be --to be processed into an object--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 15-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, while it is noted that paragraph 0035 of the present application sets forth that the space 50 “is linked with the gap portion 95, so that a portion of oil provided in the gap portion 95 flows in to the space 50”, and furthermore it is noted that paragraph 0038 sets forth that the oil intervened between the end surface 34 of the rotating table 30 and the opposing surface 42 “functions as a damper, and swiftly decreases the oscillation generated in the rotating table 30”, it is however noted that the specification as originally filed does not appear to teach that the action of the oil “flowing” from the claimed gap to the claimed space occurs “while said rotating table is stopped” as claimed.

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4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 15-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As set forth in the claim, there is no temporal frame of reference provided for determining with respect to what time frame the oscillation of the table is “promptly” attenuated, i.e., “promptly” relative to what point in time?

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

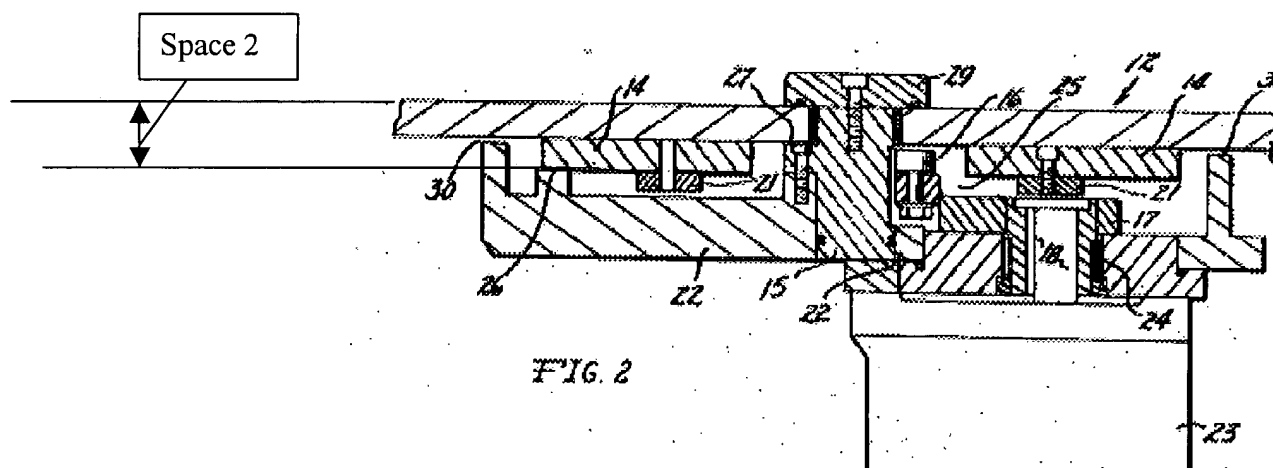
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 15 and 19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Pat. No. 3,750,494 (Rice).

Rice teaches a rotary indexing table 11 (see Figures 1-2, for example) having a plurality of work stations 12 (Figure 1, col. 3, lines 34-40, for example). Additionally, Rice teaches a base or frame 22, constituting a “housing”, which “housing” 22 supports a shaft 18 driven by actuator 23 (Figure 1, col. 4, lines 30-32, for example). The actuator 23 ultimately drives the table 11 in rotation via the shaft 18 and cams 14 and cam followers 16 (Figures 1-2, col. 4, lines 4-9, for example).

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Additionally, the “housing” 22 has a “gap” therein, including (but not limited to) the cavity 24. Further note that the housing 22, at the portion indicated at 26 in Figure 2, has an upper surface that “opposes” an end surface of the table to create a space therebetween, labeled “Space 2” in the partial reproduction of Figure 2 below. Alternatively note that Rice explicitly teaches, in col. 3, lines 38-40, that the cams 14 can be made integral with the table 11, and thus the space between the upper surface of the housing 22 at 26 and the lower surface of a cam member 14 integral with the table at the location 26 can be considered such a space. Rice specifically teaches that there is lubricant in cavity or “gap” 24, and further specifies that the cavity 24 is full enough of lubricant to lubricate the surfaces 26 (col. 4, line 57-61, also Figure 2). Note that the lubricant described by Rice would appear to encompass oil.



Regarding the oil “flow” from the “gap” 24 into the space (either of the alternatives described above) “while the rotating table is stopped” as claimed, firstly, it is noted that as previously described, Rice teaches that the gap 24 is sufficiently full of lubricant to lubricate surfaces 26, and thus there is lubricant present in the claimed “space” when the table is stopped. Secondly, specifically regarding the flow, it appears to be inherent that if the cavity is as full of

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lubricant as was described previously, that the momentum of the table would cause the lubricant to “flow”, at least momentarily, into the space from the gap at the time of stopping and/or immediately thereafter.

Regarding the “prompt attenuation” of the oscillations of the table “in the stopped position”, note that column 6, lines 28- 34 specifically teach that the device taught by Rice exhibits “minimal backlash”, which appears to implicitly be a teaching of such attenuation.

In the alternative, Rice does not explicitly state that the lubricant used is oil, although this would appear to be implicit via the description of the cavity as “sufficiently full” (col. 4, lines 57-61). Additionally, Rice does not explicitly state that “oscillation” of the table “in the stopped position” is “promptly attenuated”.

Regarding the lubricant, Examiner takes Official Notice that the use of oil as a lubricant is notoriously well-known in the art. Since Rice does not provide a teaching prohibiting the use of oil as such a lubricant, the substitution of a well-known lubricant (e.g., oil) for the generically taught “lubricant” would therefore have been obvious to one having ordinary skill in the art at the time the invention was made since it would have been an obvious matter of design choice to a person of ordinary skill in the art to choose any of a number of types of well-known lubricants, depending on the particular requirements of an end user, to enjoy any of the known benefits that accrue thereto. For example, such choice could be made based on the availability of a particular lubricant at the time of design.

Regarding the attenuation of oscillations, it is noted that the use of a damper device to attenuate torsional vibrations, for example, of an intermittently rotating device is well-known,

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and thus to have provided the device taught by Rice with such a well-known damper device would have been obvious to one having ordinary skill in the art at the time the invention was made for the purpose of reaping the known benefits that accrue to such a device, such as decreased wear and tear on the machine parts.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claim 16, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 3,750,494 (Rice) as applied to claim 15 above.

Rice teaches all aspects of the claimed invention as described in the above rejection based thereon, but is silent about the dimensions of either of the described “spaces”.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made such dimensions whatever was desired or expedient to an end user, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

10. Claims 15-17 and 19, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over British Patent No. 608,048 (hereinafter ‘048) in view of U.S. Pat. No. 5,243,869 (Kukowski).

‘048 teaches a rotating table apparatus including a driven shaft 6 supported by a bearing member 7, which bearing member forms a portion of a “housing” 7. The table is driven in rotation by a worm 3 (driven by shaft 6, which is driven by an “actuator, see page 2, lines 14-17,

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also Figures 1-2), analogous to the “roller gear cam” of the present invention, which drives a helical wheel 2 that is rigidly connected to the plate 1, wheel 2 is analogous to the “cam followers” of the present invention. Note that the plate 1 has a lower surface (as viewed in Figure 1) that opposes an upper surface of stationary nut 9 (page 2, line 40), which nut forms a part of the “housing” along with bearing member 7 and support 15, for example, providing chamber or “space” 24 therebetween (between the described upper and lower surfaces). Also note that the aforescribed lower surface of the table is considered an “end” surface of the table in that it is an end surface of the disc portion of plate 1, see Figure 1. Additionally, ‘048 teaches that “housing” portion or bearing member 7 includes an oil reservoir located within a “gap” therein (Figure 1, also page 2, lines 64-82). Note that ‘048 specifically teaches that the oil reservoir is “linked” to the chamber 24 (page 2, lines 64-82), and also teaches that the oil is used for lubricating the worm 3 and the wheel 2 (page 2, lines 67-88, for example, also Figure 1).

Regarding the limitation from claim 15 “and a portion of said oil flows from said gap portion into said space while said rotating table is stopped”, it is noted that there appears to be nothing preventing ‘048’s device from so functioning. Note that if the rotation of the table is stopped in such a position that the cam 18 is providing the downward motion of the piston 19, it appears that, at least momentarily (beyond the stopping), oil would continue to flow into chamber 24 (see page 2, lines 68-82, for example).

Regarding claim 17, it is noted that the plate 1 taught by ‘048 appears to be capable of performing the functionally claimed “intermittent” rotation, for example, via intermittent actuation of the gearbox that ultimately drives the worm 3 (page 2, lines 11-17 teach about the gearbox driving the worm). Note that no structure of the cam is set forth that requires the

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intermittent rotation to be as a result of any continuous rotation of the cam, and it is noted that the device is inherently capable of such intermittent actuation of the gearbox, via, for example, manually connecting and disconnecting the gearbox to its driver or power source.

Regarding claim 19, it is noted that '048 sets forth that plate 1 is a "work-carrying plate in a metal cutting machine tool" (p. 1, lines 10-12, for example). In order for the plate to hold the work such that it does not fall off the table when being machined, it is necessary that it be held or fixed to the table by some sort of device, i.e., the forces applied to a workpiece by a machine tool during cutting are great enough to require that the workpiece be held in some way to prevent the workpiece from flying off of the table during the cutting process. Thus, inherently, in order for '048's plate device to be functional with a "metal cutting machine tool" as disclosed, there must be some sort of holding device, which device is considered to be a "chuck".

'048 teaches the worm 3 and wheel 2 drive instead of a "roller gear cam" and "cam followers". Additionally, '048 is silent as to the dimensions of the described "space", and thus does not teach the dimensions set forth in claim 16.

Kukowski teaches a cam operated indexing drive including a cam body 30 and plate member 35 with followers 36 (see Figure 1, for example). Kukowski further teaches that cam operated indexing drives have high mechanical efficiencies and zero backlash (col. 1, lines 24-25, for example).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the cam operated drive taught by Kukowski for the

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worm and worm wheel taught by '048 for the purpose of increasing the mechanical efficiency and eliminating any backlash of '048's drive system as taught by Kukowski.

Regarding the dimensions of claim 16, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the space whatever size was desired or expedient, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Specifically regarding the limitation in claim 15 "wherein oscillation of said rotating table in the stopped position is promptly attenuated", it is noted that it appears that the only place where the present specification as originally filed mentions the attenuation or dampening of oscillations when the table is "in the stopped position" as claimed is in paragraph 0050, which states that "when a roller gear cam 22 and cam followers 32 which gear thereto are used to intermittently rotate the rotating table 30, oscillation may be swiftly dampened when the rotating table is stopped and at time of stopping, as well as no deterioration of precision in stopping caused by back-lash". Thus, it appears that the use of the "roller gear cam" and "cam followers" taught by the present specification inherently act to perform the claimed function of promptly attenuating oscillation of the table "in the stopped position". Thus, it appears, via the described teaching by Applicant's specification, as well as the explicit teaching set forth in Kukowski that cam operated indexing drives have high mechanical efficiencies and zero backlash (col. 1, lines 24-25, for example), that the use of the cam system taught by Kukowski would inherently serve to "promptly attenuate" oscillations of the table "in the stopped position" as set forth in claim 15.

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(Note that claim 15 does not actually set forth any particular structure to perform the function of “promptly attenuating” the oscillations of the rotary table “in the stopped position”.)

However, regarding the attenuation of oscillations, in the alternative, it is noted that the use of a damper device to attenuate torsional vibrations, for example, of an intermittently rotating device is well-known, and thus to have provided the device taught by ‘048 with such a well-known damper device would have been obvious to one having ordinary skill in the art at the time the invention was made for the purpose of reaping the known benefits that accrue to such a device, such as decreased wear and tear on the machine parts.

11. Claims 15 and 17-18, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 4,896,560 (Kato) in view of British Patent No. 608,048 (hereinafter ‘048).

Kato teaches an indexing device 8 for indexing a turret 30 having cutting tool 32 affixed thereto (Figures 1-2, col. 1, lines 6-21, also col. 5, lines 2-5). Kato’s indexing device includes a globoidal cam 36 and cam followers 40 (see Figure 3).

Regarding the limitation in claim 15 “wherein oscillation of said rotating table in the stopped position is promptly attenuated”, it is noted that it appears that the only place where the present specification as originally filed mentions the attenuation or dampening of oscillations when the table is “in the stopped position” as claimed is in paragraph 0050, which states that “when a roller gear cam 22 and cam followers 32 which gear thereto are used to intermittently rotate the rotating table 30, oscillation may be swiftly dampened when the rotating table is stopped and at time of stopping, as well as no deterioration of precision in stopping caused by back-lash”. Thus, it appears that the use of the “roller gear cam” and “cam followers” taught by

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the present specification inherently act to perform the claimed function of promptly attenuating oscillation of the table “in the stopped position”. Additionally, Kato provides teachings that “when the cam follower is in engagement with the dwell portion, the output shaft is secured firmly at the desired position...” (col. 1, lines 51-55) and that “the present device can reduce frictional loss of power during normal operations and increase impact resistance in case of emergency, and can attain improvements in rigidity and durability” (col. 2, lines 64-68, for example). Thus, it appears, via the described teaching by Applicant’s specification, as well as the described teachings set forth in Kato that the use of the cam system taught by Kato would inherently serve to “promptly attenuate” oscillations of the table “in the stopped position” as set forth in claim 15. (Note that claim 15 does not actually set forth any particular structure to perform the function of “promptly attenuating” the oscillations of the rotary table “in the stopped position”.)

Kato does not teach any sort of lubricating device for keeping the driving parts lubricated.

‘048 teaches a rotating table apparatus including a driven shaft supported in a bearing member 7, which bearing member forms a portion of a “housing” 7. The table is driven in rotation by a worm 3, analogous to the “roller gear cam” of the present invention, which drives a helical wheel 2 that is rigidly connected to the plate 1, wheel 2 is analogous to the “cam followers” of the present invention. Note that the plate 1 has a lower surface (as viewed in Figure 1) that opposes an upper surface of stationary nut 9 (page 2, line 40), for example, “invariably” (since neither 9 nor 1 move vertically as viewed in Figure 1, see page 2, lines 35-46, for example) providing chamber or “space” 24 therebetween. Additionally, ‘048 teaches that

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“housing” portion or bearing member 7 includes an oil reservoir located within a “gap” therein (Figure 1, also page 2, lines 64-82). Note that ‘048 specifically teaches that the oil reservoir is “linked” to the chamber 24 (page 2, lines 64-82), and also teaches that the oil is used for lubricating the worm 3 and the wheel 2 (page 2, lines 67-88, for example, also Figure 1).

Regarding the limitation from claim 15 “and a portion of said oil flows from said gap portion into said space while said rotating table is stopped”, it is noted that there appears to be nothing preventing ‘048’s device from so functioning. Note that if the rotation of the table is stopped in such a position that the cam 18 is providing the downward motion of the piston 19, it appears that, at least momentarily (beyond the stopping), oil would continue to flow into chamber 24 (see page 2, lines 68-82, for example).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided the housing and lubrication system taught by ‘048 to the device taught by Kato for the purpose of increasing the longevity of Kato’s drive device by reducing friction and wear via the provision of the lubrication.

Additionally, regarding the attenuation of oscillations, in the alternative, it is noted that the use of a damper device to attenuate torsional vibrations, for example, of an intermittently rotating device is well-known, and thus to have provided the device taught by Kato with such a well-known damper device would have been obvious to one having ordinary skill in the art at the time the invention was made for the purpose of reaping the known benefits that accrue to such a device, such as decreased wear and tear on the machine parts.

Response to Arguments

12. Applicant's arguments with respect to claims 15-19 have been considered but are on the whole, rendered, moot in view of the new ground(s) of rejection. However, Examiner will address any of those remarks which have not been addressed by the rejections above.

It is noted that Applicant has asserted that:

Additionally, the oil between the end surface of the rotating table and the opposing surface of the housing functions as a damper. In other words, according to claim 15, oscillation of the rotating table in the stopped state is attenuated promptly.

However, in regards to this statement, Examiner would like to point out that claim 15 does not set forth that the “the oil between the end surface of the rotating table and the opposing surface of the housing” serves to attenuate any oscillations of the rotating table. Additionally, Examiner notes that as set forth in the specification, it does not appear that Applicant’s invention functions as argued by Applicant. As set forth in the specification, the oil between the end surface of the table and the opposing housing surface functions as a damper to swiftly decrease oscillations when the table is rotating, not when it is stopped (see paragraph 0038, for example). See further the above 112, first paragraph rejection which describes what appears to be the only teaching in the specification related to dampening of oscillations in the table when it is “stopped” as claimed, which dampening is described as an inherent function of the roller gear cam and cam follower driving arrangement, and which dampening in the stopped position does not appear to be related to the oil as asserted by Applicant.

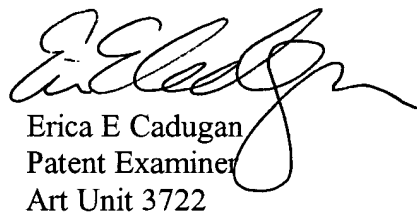
Faxing of Responses to Office Actions and Contact Information

13. In order to reduce pendency and avoid potential delays, TC 3700 is encouraging FAXing of responses to Office Actions directly into the Group at (703) 872-9306. This practice may be

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used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into TC 3700 will be promptly forwarded to the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica Cadugan whose telephone number is (703) 308-6395. The examiner can normally be reached on Monday through Thursday from 7:30 a.m. to 5:00 p.m., and every other Friday from 7:30 a.m. to 4:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A.L. Wellington can be reached at (703) 308-2159. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 3700 receptionist whose telephone number is (703) 308-1148.



Erica E Cadugan
Patent Examiner
Art Unit 3722

eec

January 15, 2003